ComfoAir XL
ComfoAir Eco
ComfoAir XL Eco

Modbus Manual

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Heating | Cooling | Fresh Air | Clean Air

Foreword

Read this document carefully before use.

This document provides all the information required for safe and optimal operation of the Modbus connection on the ComfoAir XL, ComfoAir Eco and ComfoAir XL Eco. In this document the ComfoAir XL, ComfoAir Eco and ComfoAir XL Eco will be referred to as “the unit”. The unit is subject to continuous development and improvement. As a result, the unit may slightly differ from the descriptions.

The following pictograms are used in this document:

Point of attention.

Risk of:
- damage to the device;
- performance of the device is compromised if instructions are not observed carefully.

Risk of personal injury for the user.

Maintenance

Questions
Please contact the supplier if you have any questions or would like to order a new document or new filters. The contact details of the main supplier(s) can be found in the back of this document.

References

- LSoft – ComfoAir XL Holding Registers v3.06;
- SenseTech – ComfoSchool – Modbus parameter specification v1.05;
- Modbus-IDA – Modbus over serial line specification and implementation guide v1.02;
- Modbus-IDA – Modbus Application Protocol Specification v1.1b.

Table of contents

1 Protocol overview

This document contains the necessary information for interfacing with the unit using the RS485 communication interface. The interface is built on the Modbus RTU (Remote Terminal Unit) specification over TIA/EIA-485 (RS485). Here a single master – multiple slave communication mechanism is used, where the CCU is configured as a slave unit.

1. Application	Modbus application protocol
2. Presentation	
3. Session	
4. Transport	
5. Network	
6. Data link	Modbus Serial line protocol
7. Physical	TIA/EIA-485

Physical, data link and application layer are described in the following chapters.

2 Physical layer communication

2.1 Modbus settings (M80)

Modbus settings for the unit can be adjusted in parameter menu M80. In M80 the user can adjust the address, baud rate, parity and watchdog communication.

The slave address of the unit is default 0 and can be adjusted from 1-247 (M80-01).

The unit offers the following baud rate, parity and stopbits (M80-02):

setting	bps;	parity;	stopbit;
0:	19200	even	1
1:	19200	none	2
2:	9600	even	1
3:	9600	none	2

Watchdog communication is default set on 0 seconds and can be adjusted from 0-999 seconds (M80-03). When communication is lost, the forced digital inputs (M30) will be reset.

2.2 I/O board

Two communication ports on the I/O board are used to connect the unit to a Modbus field bus. These two communication ports are wired in parallel and can be used to expand the Modbus network. The connectors for Modbus can be found at X9 on the I/O board (see figure 2.1, 2.2 and 2.3), A6/B6/GND and A7/B7/GND.

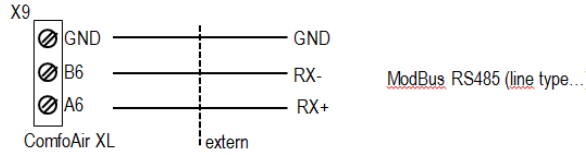


Figure 2.1: Modbus connection on the I/O board

2.3 Miscellaneous

The physical communication is limited by a maximum of 32 slaves/units and/or a total cable length of 1000 meters, depending on cable quality.

When more than one unit is connected by Modbus, a 1k Ω terminator between A and B is recommended.

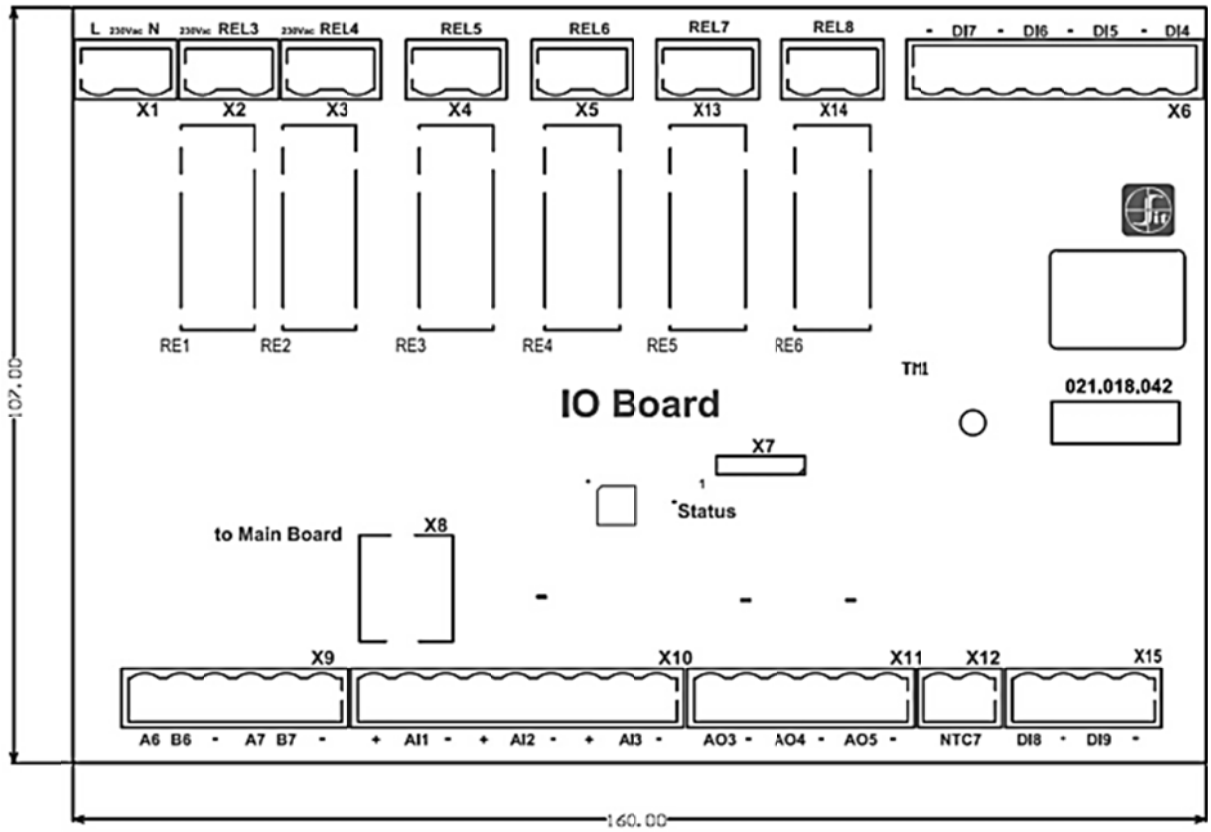


Figure 2.2: I/O board (v2.00)

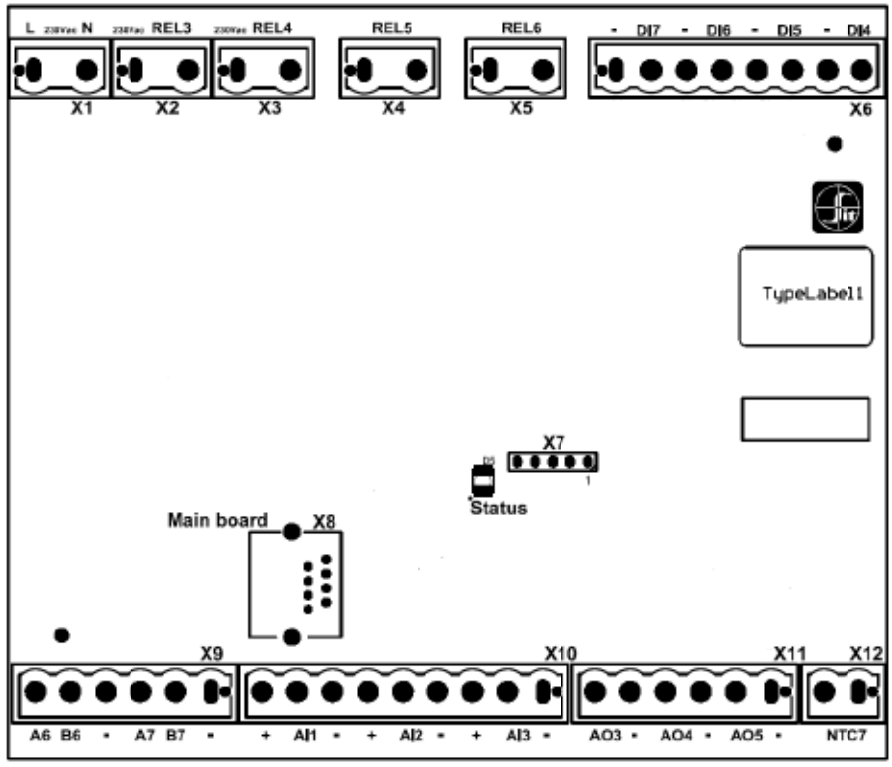
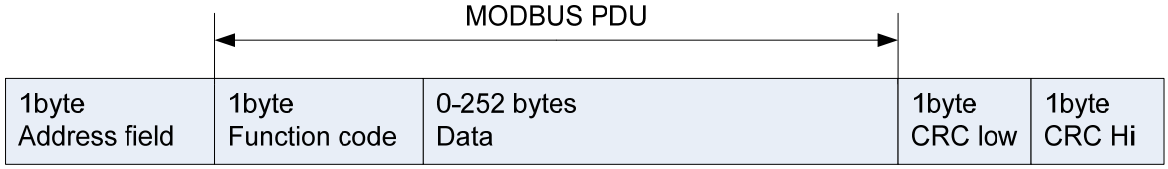


Figure 2.3: I/O board (v1.00)

3 Data link layer communication

3.1 Data structure

Application level communication takes place over a Modbus Serial line PDU.

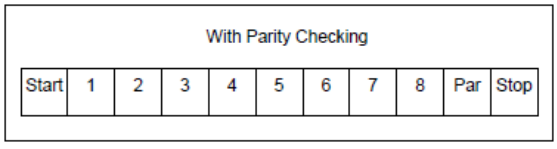


3.2 Modbus RTU

Modbus RTU (remote terminal unit) uses byte encode protocol style, every data byte in the message will be send as 8 bits, LSB..MSB.
The application level protocol (PDU) is packed inside an address field and CRC. The PDU message is explained in chapter 4 (Application layer communication).

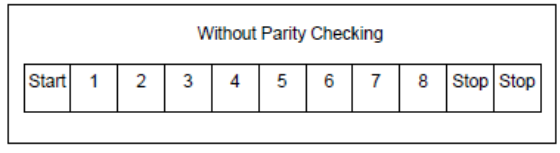
Bits per Byte (even parity):

- 1 start bit;
- 8 data bits, LSB sent first;
- 1 bit for parity completion;
- 1 stop bit.



Bits per Byte (none parity):

- 1 start bit;
- 8 data bits, LSB sent first;
- 2 stop bits.



Address:
The address field is 1-247 for slave addressing. This means that up to 247 slave devices can communicate with one master on the same network. Address 0 is reserved for broadcasting messages.

CRC:
The CRC (Cyclical Redundancy checking) is calculated using a CRC16 algorithm with a polynomial value of 0xA001

3.3 Frame synchronisation

The minimum delay between 2 RTU frames is 3.5 data bytes. This time is used for detecting start and end of the frame.

Depending on the baud rate this is:

- 19200bps 8E1 = 2.0 msec;
- 9600bps 8E1 = 4.0 msec.

4 Application layer communication

Supported Modbus commands:

Code	Command
0x03	Read Holding Registers
0x06	Write Single Register

Summary:
Values are 16 bits wide 0x0000 – 0xFFFF in big endian order.

The format of these values is signed and unsigned. Only temperature values are signed, because these values can be negative. All other values are unsigned. Chapter 5 gives the format for each holding register.

All holding registers are stored on flash memory and all writes are therefore limited. Except holding registers in M30 – Overrule. These holding registers are meant to overrule digital inputs and force ventilation speed. All writes on these holding registers (M30) are unlimited.

All other commands will return a default error message in the following format in case a failure occurred.

Response:

<Function Code>	[1 byte]	0x80 + requested Command
<Exception Code>	[1 byte]	0x01

4.1 Read Holding Registers (0x03)

Summary:
This command is used to read the status of holding register values.

Request:

<Function Code>	[1 byte]	0x03
<Starting Address>	[2 bytes]	0x0000 to 0xFFFF
<Quantity of Registers>	[2 bytes]	1 to 125

Response:

<Function Code>	[1 byte]	0x03
<Byte Count>	[1 byte]	2 x N*
<Input Status>	[N* x 2 bytes]	

*N = Quantity of Registers (max 120 registers in one read action)

Error:

<Function Code>	[1 byte]	0x83
<Exception Code>	[1 byte]	0x02 – 0x04*

*0x02 = Starting Address or Starting Address + Quantity of Registers out of range
*0x03 = Quantity of Registers out of range
*0x04 = Hardware failure reading Registers

4.2 Write Single Register (0x06)

Summary:
This command is used to write a single holding register in the device.

Request:

<Function Code>	[1 byte]	0x06
<Output Address>	[2 bytes]	0x0000 to 0xFFFF
<Output Value>	[2 bytes]	0x0000 to 0xFFFF

Response:

<Function Code>	[1 byte]	0x06
<Output Address>	[2 bytes]	0x0000 to 0xFFFF
<Output Value>	[2 bytes]	0x0000 to 0xFFFF

Error:

<Function Code>	[1 byte]	0x86
<Exception Code>	[1 byte]	0x02 – 0x04*

*0x02 = Output Address out of range
*0x03 = Output Value out of range
*0x04 = Hardware failure writing output

5 Holding Registers

The holding registers given in this manual are based on product firmware version 3.10.

If not indicated differently, 0 = OFF / NO, 1 = ON / YES.

Reading not existing holding registers will return "0" as data, no exception will be generated.

All "writes" are limited write's to flash, except menu M30.

The write cycle limitation for all flash registers is limited for:
- 1,000 times guaranteed up to 80˚C, 10 years data retention
- 10,000 times guaranteed up to 50˚C, 10 years data retention

M1 – Actual Controls

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0101	r	16 bit signed			0.0	°C	Temp NTC1 (ODA)
0102	r	16 bit signed			0.0	°C	Temp NTC2 (SUP)
0103	r	16 bit signed			0.0	°C	Temp NTC3 (ETA)
0104	r	16 bit signed			0.0	°C	Temp NTC4 (EHA)
0105	r	16 bit signed			0.0	°C	Temp NTC5
0106	r	16 bit signed			0.0	°C	Temp NTC6
0107	r	16 bit signed			0.0	°C	Temp NTC7
0108	r	16 bit unsigned			0	m^3/h	Request Supply air
0109	r	16 bit unsigned			0	m^3/h	Request Exhaust air
0110	r	16 bit unsigned			0	m^3/h	Actual Supply air
0111	r	16 bit unsigned			0	m^3/h	Actual Exhaust air
0112	r	16 bit unsigned			0.0	%	Control Supply fan
0113	r	16 bit unsigned			0.0	%	Control Exhaust fan
0114	r	16 bit unsigned			0	Pa	Press Supply nozzle
0115	r	16 bit unsigned			0	Pa	Press Exhaust nozzle
0116	r	16 bit unsigned			0	Pa	Press Supply filter
0117	r	16 bit unsigned			0	Pa	Press Exhaust filter
0118	r	16 bit unsigned			0	%	Request ventilation
0119	r	16 bit unsigned			0.00	%	Actual heatwheel speed
0120	r	16 bit unsigned			0.0	%	Actual heatwheel efficiency
0121	r	16 bit unsigned			0.00	%	Actual bypass state
0122	r	16 bit unsigned			0.0	%	Actual PreHeat ODA control
0123	r	16 bit unsigned			0.0	%	Actual PreHeat ETA control
0124	r	16 bit unsigned			0.0	%	Actual Post-Heater control
0125	r	16 bit unsigned			0.0	%	Actual Post-Cooler control
0126	r	16 bit unsigned			0.0	%	Actual Post-Heater/Cooler control

M2 – Ventilation

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0201	r/w	16 bit unsigned	0	20000	0	m^3/h	Supply air 1
0202	r/w	16 bit unsigned	0	20000	0	m^3/h	Supply air 2
0203	r/w	16 bit unsigned	0	20000	0	m^3/h	Supply air 3
0204	r/w	16 bit unsigned	0	20000	0	m^3/h	Supply air 4
0205	r/w	16 bit unsigned	0	20000	0	m^3/h	Exhaust air 1
0206	r/w	16 bit unsigned	0	20000	0	m^3/h	Exhaust air 2
0207	r/w	16 bit unsigned	0	20000	0	m^3/h	Exhaust air 3
0208	r/w	16 bit unsigned	0	20000	0	m^3/h	Exhaust air 4
0209	r/w	16 bit unsigned	1	4	0		Summernight ventilation speed (1..4)
0210	r/w	16 bit unsigned	0	5	0		Flow control ■ 0: Constant Flow (internal); ■ 1: Constant Pressure (positive); ■ 2: Constant Pressure (negative); ■ 3: 0..10V (positive); ■ 4: 0..10V (negative); ■ 5: Direct Fan Control.

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0211	r/w	16 bit unsigned	0	500	0	Pa	Constant pressure setpoint supply air (Pa)
0212	r/w	16 bit unsigned	0	500	0	Pa	Constant pressure setpoint exhaust air (Pa)
0213	r/w	16 bit unsigned	0	500	0	Pa	Constant pressure second setpoint supply air (Pa)
0214	r/w	16 bit unsigned	0	500	0	Pa	Constant pressure second setpoint exhaust air (Pa)
0215	r/w	16 bit unsigned	0	100	0.0	V	0..10V setpoint supply air
0216	r/w	16 bit unsigned	0	100	0.0	V	0..10V setpoint exhaust air
0217	r/w	16 bit unsigned	0	100	0.0	V	0..10V second setpoint supply air
0218	r/w	16 bit unsigned	0	100	0.0	V	0..10V second setpoint exhaust air
0219	r/w	16 bit unsigned	0	100	0	%	Fire supply air, 0 or 100%
0220	r/w	16 bit unsigned	0	100	0	%	Fire exhaust air, 0 or 100%
0221	r/w	16 bit unsigned	0	100	0	%	Fire overrule supply air, 0 or 100%
0222	r/w	16 bit unsigned	0	100	0	%	Fire overrule exhaust air, 0 or 100%

M3 – Heat recovery wheel settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0301	r/w	16 bit unsigned	0	50	0	%	Minimum speed wheel
0302	r/w	16 bit unsigned	50	100	0	%	Maximum speed wheel
0303	r/w	16 bit unsigned	1	999	0	hrs	Maximum inactivity period

M4 – Ventilation settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0401	r/w	16 bit unsigned	1000	100000	0	m^3/h	Supply Air P-zone
0402	r/w	16 bit unsigned	1	240	0	sec	Supply Air I-time
0403	r/w	16 bit unsigned	1000	100000	0	m^3/h	Exhaust Air P-zone
0404	r/w	16 bit unsigned	1	240	0	sec	Exhaust Air I-time
0405	r/w	16 bit unsigned	0	800	0		Supply Air k-value pressure nozzle
0406	r/w	16 bit unsigned	0	800	0		Exhaust Air k-value pressure nozzle
0407	r/w	16 bit unsigned	100	20000	0	m^3/h	Maximum Supply Air
0408	r/w	16 bit unsigned	100	20000	0	m^3/h	Maximum Exhaust Air
0409	r/w	16 bit unsigned	1	999	0	sec	Pa (Constant pressure) I-time
0410	r/w	16 bit unsigned	1	999	0	sec	0..10V I-time
0411	r/w	16 bit unsigned	50	150	0	%	Airflow Factor
0412	r/w	16 bit unsigned	0	20000	0	m^3/h	Minimum Airflow

M5 – Digital Input settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0501	r/w	16 bit unsigned	0	27	0		Input 1 ▪ 0: No function; ▪ 1: Ventilation 1; ▪ 2: Ventilation 2; ▪ 3: Ventilation 3; ▪ 4: Ventilation 4; ▪ 5: Failure supply fan (normal closed); ▪ 6: Failure supply fan (normal open); ▪ 7: Failure exhaust fan (normal closed); ▪ 8: Failure exhaust fan (normal open); ▪ 9: Failure heatwheel (normal open); ▪ 10: Failure heatwheel (normal closed); ▪ 11: Frost protection (normal closed); ▪ 12: Frost protection (normal open); ▪ 13: Enable heatwheel; ▪ 14: Enable supply fan; ▪ 15: Enable exhaust fan; ▪ 16: Enable post-heater; ▪ 17: Enable post-cooler; ▪ 18: Failure (normal closed); ▪ 19: Enable ComfoAir XL; ▪ 20: Fire Contact (normal closed); ▪ 21: Enable Summernight Ventilation; ▪ 22: Heat/Cool mode (coolmode = closed); ▪ 23: Reset all failures (closed = reset); ▪ 24: Enable Fire Overrule; ▪ 25: Second setpoint select (only active for 0210=1-4); ▪ 26: Enable time clock; ▪ 27: Fire Damper open.
0502	r/w	16 bit unsigned	0	27	0		Input 2
0503	r/w	16 bit unsigned	0	27	0		Input 3
0504	r/w	16 bit unsigned	0	27	0		Input 4 (I/O board)
0505	r/w	16 bit unsigned	0	27	0		Input 5 (I/O board)
0506	r/w	16 bit unsigned	0	27	0		Input 6 (I/O board)
0507	r/w	16 bit unsigned	0	27	0		Input 7 (I/O board)
0508	r/w	16 bit unsigned	0	27	0		Input 8 (I/O board)
0509	r/w	16 bit unsigned	0	27	0		Input 9 (I/O board)

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0511	r	16 bit unsigned	0	1	0		Actual input 1
0512	r	16 bit unsigned	0	1	0		Actual input 2
0513	r	16 bit unsigned	0	1	0		Actual input 3
0514	r	16 bit unsigned	0	1	0		Actual input 4 (I/O board)
0515	r	16 bit unsigned	0	1	0		Actual input 5 (I/O board)
0516	r	16 bit unsigned	0	1	0		Actual input 6 (I/O board)
0517	r	16 bit unsigned	0	1	0		Actual input 7 (I/O board)
0518	r	16 bit unsigned	0	1	0		Actual input 8 (I/O board)
0519	r	16 bit unsigned	0	1	0		Actual input 9 (I/O board)

M6 – Relay settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0601	r/w	16 bit unsigned	0	14	0		Relay 1 ▪ 0 : No function; ▪ 1 : Alarm (normally open); ▪ 2 : Supply Dampers (valve); ▪ 3 : Exhaust Dampers (valve); ▪ 4 : Bypass (valve); ▪ 5 : Post-Heater (pump); ▪ 6 : Post-Cooler (pump); ▪ 7 : Sifon heating; ▪ 8 : ComfoAir XL active; ▪ 9 : Post-Cooler/Heater (pump); ▪ 10: Summernight ventilation active; ▪ 11: PreHeat ODA (pump); ▪ 12: Filter Alarm active; ▪ 13: PreHeat ETA (pump); ▪ 14: Fire Damper.
0602	r/w	16 bit unsigned	0	14	0		Relay 2
0603	r/w	16 bit unsigned	0	14	0		Relay 3 (I/O board)
0604	r/w	16 bit unsigned	0	14	0		Relay 4 (I/O board)
0605	r/w	16 bit unsigned	0	14	0		Relay 5 (I/O board)
0606	r/w	16 bit unsigned	0	14	0		Relay 6 (I/O board)
0607	r/w	16 bit unsigned	0	14	0		Relay 7 (I/O board)
0608	r/w	16 bit unsigned	0	14	0		Relay 8 (I/O board)
0611	r	16 bit unsigned	0	1	0		Relay 1 control (Off/On)
0612	r	16 bit unsigned	0	1	0		Relay 2 control (Off/On)
0613	r	16 bit unsigned	0	1	0		Relay 3 control (Off/On) (I/O board)
0614	r	16 bit unsigned	0	1	0		Relay 4 control (Off/On) (I/O board)
0615	r	16 bit unsigned	0	1	0		Relay 5 control (Off/On) (I/O board)
0616	r	16 bit unsigned	0	1	0		Relay 6 control (Off/On) (I/O board)
0617	r	16 bit unsigned	0	1	0		Relay 7 control (Off/On) (I/O board)
0618	r	16 bit unsigned	0	1	0		Relay 8 control (Off/On) (I/O board)

M7 – Analog output settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0701	r/w	16 bit unsigned	0	9	0		Analog output 1 ▪ 0 : No function; ▪ 1 : Supply fan; ▪ 2 : Exhaust fan; ▪ 3 : Heat wheel; ▪ 4 : Post-Heater (valve); ▪ 5 : Post-Cooler (valve); ▪ 6 : Post-Cooler/Heater (valve); ▪ 7 : Modulated bypass valve; ▪ 8 : PreHeat ODA valve; ▪ 9 : PreHeat ETA valve.
0702	r/w	16 bit unsigned	0	9	0		Analog output 2
0703	r/w	16 bit unsigned	0	9	0		Analog output 3 (I/O board)
0704	r/w	16 bit unsigned	0	9	0		Analog output 4 (I/O board)
0705	r/w	16 bit unsigned	0	9	0		Analog output 5 (I/O board)
0711	r	16 bit unsigned	0	1000	0.0	%	Analog output 1 control
0712	r	16 bit unsigned	0	1000	0.0	%	Analog output 2 control
0713	r	16 bit unsigned	0	1000	0.0	%	Analog output 3 control (I/O board)
0714	r	16 bit unsigned	0	1000	0.0	%	Analog output 4 control (I/O board)
0715	r	16 bit unsigned	0	1000	0.0	%	Analog output 5 control (I/O board)

M8 – Communication settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0801	r/w	16 bit unsigned	0	5	0		Comport 1 ▪ 0 : No function; ▪ 1 : Supply fan (EBM bus); ▪ 2 : Exhaust fan (EBM bus); ▪ 3 : Supply fan (EBM Modbus); ▪ 4 : Exhaust fan (EBM Modbus); ▪ 5 : Heat wheel (FUJI bus).
0802	r/w	16 bit unsigned	0	5	0		Comport 2
0803	r/w	16 bit unsigned	0	5	0		Comport 3
0804	r/w	16 bit unsigned	0	5	0		Comport 4
0805	r/w	16 bit unsigned	0	5	0		Comport 5
0811	r	16 bit unsigned	0	1000	0.0	%	Comport 1 control
0812	r	16 bit unsigned	0	1000	0.0	%	Comport 2 control
0813	r	16 bit unsigned	0	1000	0.0	%	Comport 3 control
0814	r	16 bit unsigned	0	1000	0.0	%	Comport 4 control
0815	r	16 bit unsigned	0	1000	0.0	%	Comport 5 control

M9 – Analog input settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
0901	r/w	16 bit unsigned	0	9	0		Analog Input 1 (I/O board) ▪ 0 : No function; ▪ 1 : No function; ▪ 2 : No function; ▪ 3 : Proportional ventilation; ▪ 4 : Supply air pressure (0..500Pa); ▪ 5 : Exhaust air pressure (0..500Pa); ▪ 6 : Supply air pressure (0..300Pa); ▪ 7 : Exhaust air pressure (0..300Pa); ▪ 8 : Supply air 0..10V input; ▪ 9 : Exhaust air 0..10V input.
0902	r/w	16 bit unsigned	0	9	0		Analog Input 2 (I/O board)
0903	r/w	16 bit unsigned	0	9	0		Analog Input 3 (I/O board)
0911	r	16 bit unsigned	0	1000	0.0	%	Analog Input 1 reading (I/O board)
0912	r	16 bit unsigned	0	1000	0.0	%	Analog Input 2 reading (I/O board)
0913	r	16 bit unsigned	0	1000	0.0	%	Analog Input 3 reading (I/O board)

M10 – Temp Control

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
1001	r/w	16 bit unsigned	0	1	0		Controlmode supply temp. ▪ 0 : Tcomfort (T5 controlled with (Tcomfort-T3)); ▪ 1 : Outdoor heatline (T5 controlled with M10-02..16).
1002	r/w	16 bit signed	-200	200	0.0	°C	TH(low) outdoortemp , low point outdoor temp. heating
1003	r/w	16 bit signed	100	800	0.0	°C	TH(low) supplytemp , low point supplytemp heating
1004	r/w	16 bit signed	-200	200	0.0	°C	TH(med) outdoortemp medium point outdoortemp heating
1005	r/w	16 bit signed	100	800	0.0	°C	TH(med) supplytemp , medium point supplytemp heating
1006	r/w	16 bit signed	-200	200	0.0	°C	TH(hi) outdoortemp high point outdoortemp heating
1007	r/w	16 bit signed	100	800	0.0	°C	TH(hi) supplytemp , high point supplytemp heating
1011	r/w	16 bit signed	100	400	0.0	°C	TC(low) outdoortemp , low point outdoor temp. cooling
1012	r/w	16 bit signed	0	300	0.0	°C	TC(low) supplytemp , low point supplytemp cooling
1013	r/w	16 bit signed	100	400	0.0	°C	TC(med) outdoortemp medium point outdoortemp cooling
1014	r/w	16 bit signed	0	300	0.0	°C	TC(med) supplytemp , medium point supplytemp cooling

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
1015	r/w	16 bit signed	100	400	0.0	°C	TC(hi) outdoortemp high point outdoortemp cooling
1016	r/w	16 bit signed	0	300	0.0	°C	TC(hi) supplytemp , high point supplytemp cooling
1020	r/w	16 bit unsigned	20	500	0.0	°C	Heating P-zone
1021	r/w	16 bit unsigned	1	9999	0	sec	Heating I-time
1022	r/w	16 bit unsigned	20	500	0.0	°C	Cooling P-zone
1023	r/w	16 bit unsigned	1	9999	0	sec	Cooling I-time
1024	r/w	16 bit signed	30	200	0.0	°C	Min supply temp T2
1025	r/w	16 bit signed	200	600	0.0	°C	Max supply temp T2
1026	r	16 bit signed			0.0	°C	Tsupply request heatline (calculated on M10-02..16 and M10-25)
1027	r/w	16 bit unsigned	0	240	0	min	Min time between Heating->Cooling
1028	r/w	16 bit unsigned	0	100	0.0	°C	Delta T heat/cool failure (see failure E38/E39)
1029	r/w	16 bit signed	-100	200	0.0	°C	Min supply temp ALARM
1099	r/w	16 bit signed	50	280	0.0	°C	Comfort Temperature

M11 – Bypass settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
1101	r/w	16 bit unsigned	0	4	0		Bypass position: ▪ 0: Exhaust; ▪ 1: Exhaust, modulated; ▪ 2: Supply; ▪ 3: Supply, modulated; ▪ 4: Supply, modulated (frost).
1102	r/w	16 bit signed	0	200	0.0	°C	Setpoint exhaust temp (frost)
1103	r/w	16 bit unsigned	1	1000	0.0	°C	P-zone Bypass (frost)
1104	r/w	16 bit unsigned	1	999	0	sec	I-time Bypass (frost)
1105	r/w	16 bit signed	-200	200	0.0	°C	Min supply temp T2 (frost)
1106	r/w	16 bit signed	0	200	0.0	°C	Min supply temp T5 (frost)
1107	r/w	16 bit signed	0	100	0.0	°C	Frost protection T1 <

M12 – Heat Exchanger settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
1201	r/w	16 bit unsigned	0	1	0		Heat Exchanger
1202	r/w	16 bit signed	-200	999	0.0	°C	Frost setpoint start
1203	r/w	16 bit signed	-200	999	0.0	°C	Frost setpoint full
1204	r/w	16 bit unsigned	0	1	0		Balance ventilation (frost)

M13 – Preheat frost settings

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
1301	r/w	16 bit unsigned	0	1	0		PreHeat ODA avail
1302	r/w	16 bit signed	-200	999	0.0	°C	PreHeat ODA setpoint
1303	r/w	16 bit unsigned	1	1000	0.0	°C	PreHeat ODA P-zone
1304	r/w	16 bit unsigned	1	999	0	sec	PreHeat ODA I-time
1305	r/w	16 bit unsigned	0	1	0		PreHeat ETA avail
1306	r/w	16 bit signed	20	70	0.0	°C	PreHeat ETA setpoint (EHA)
1307	r/w	16 bit unsigned	0	999	0.0	sec	PreHeat ETA delay
1308	r/w	16 bit unsigned	1	1000	0.0	°C	PreHeat ETA P-zone
1309	r/w	16 bit unsigned	1	999	0	sec	PreHeat ETA I-time

M20 – Failures

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
2001	r	16 bit unsigned	0	49			Last failure (E number presentation)
2002	r	16 bit unsigned	0	49			Last 2 failure
2003	r	16 bit unsigned	0	49			Last 3 failure
2004	r	16 bit unsigned	0	49			Last 4 failure
2005	r	16 bit unsigned	0	49			Last 5 failure
2006	r	16 bit unsigned	0	49			Last 6 failure
2020	r	16 bit unsigned	0	99	0		Number of failures active
2021	r	16 bit unsigned	0	99	0		1st failure number*
2022	r	16 bit unsigned	0	99	0		2nd failure number*
2023	r	16 bit unsigned	0	99	0		3rd failure number*
2024	r	16 bit unsigned	0	99	0		4th failure number*
2025	r	16 bit unsigned	0	99	0		5th failure number*
2026	r	16 bit unsigned	0	99	0		6th failure number*
2027	r	16 bit unsigned	0	99	0		7th failure number*
2028	r	16 bit unsigned	0	99	0		8th failure number*
2029	r	16 bit unsigned	0	99	0		9th failure number*
2098	r/w	16 bit unsigned	0	1	0		Reset Actual Failure (Yes will auto switch back to No)
2099	r/w	16 bit unsigned	0	1	0		Reset failure list (Yes will auto switch back to No)

* 0 if no failure

M30 – Overrule

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
3001	r/w	16 bit unsigned	0	2	0		Force digin 1 ▪ 0 : No overrule; ▪ 1 : Forced open; ▪ 2 : Forced closed.
3002	r/w	16 bit unsigned	0	2	0		Force digin 2
3003	r/w	16 bit unsigned	0	2	0		Force digin 3
3004	r/w	16 bit unsigned	0	2	0		Force digin 4
3005	r/w	16 bit unsigned	0	2	0		Force digin 5
3006	r/w	16 bit unsigned	0	2	0		Force digin 6
3007	r/w	16 bit unsigned	0	2	0		Force digin 7
3008	r/w	16 bit unsigned	0	2	0		Force digin 8
3009	r/w	16 bit unsigned	0	2	0		Force digin 9
3010	r/w	16 bit unsigned	0	4	0		Force ventilation, ▪ 0 = no overrule ; ▪ 1…4 = ventilation 1…ventilation 4.
3011	r/w	16 bit unsigned	0	100	0	%	Force speed ventilation, ▪ 0% = no overrule; ▪ 1..100% = ventilation speed.
3012	r/w	16 bit unsigned	0	100	0	%	Force Supply Fan, ▪ 0% = no overrule; ▪ 1..100% = ventilation speed.
3013	r/w	16 bit unsigned	0	100	0	%	Force Exhaust Fan, ▪ 0% = no overrule; ▪ 1..100% = ventilation speed.

M50 – Miscellaneous

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
5001	r/w	16 bit unsigned	0	4	0		Function T6 ▪ 0 : No function; ▪ 1 : Sifon temperature; ▪ 2 : Adopt function of NTC5; ▪ 3 : Frost protection digital input, normaly open; ▪ 4 : Frost protection digital input, normaly closed.
5002	r/w	16 bit unsigned	0	4	0		Function T7 ▪ 0 : No function; ▪ 1 : Sifon temperature; ▪ 2 : Adopt function of NTC5; ▪ 3 : Frost protection digital input, normaly open; ▪ 4 : Frost protection digital input, normaly closed.
5003	r/w	16 bit unsigned	0	1	0		Switch SAG 0-3CV
5004	r/w	16 bit signed	-20	50	0.0	°C	Frost setpoint T1
5005	r/w	16 bit unsigned	0	100	0	%	Min heating when frost T1
5006	r/w	16 bit signed	-20	50	0.0	°C	Siphon setpoint
5007	r/w	16 bit unsigned	0	60	0	min	Overrun Time (Heater/Cooler)

M60 – Time clock

HOLDING REGISTER	R/ RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
6001	r/w	16 bit unsigned	0	1439	0	min	Real time
6002	r/w	16 bit unsigned	0	18263	0	days since 1-1-2012	Real date
6003	r	16 bit unsigned	0	5	0		Ventspeed selectclock, actual request value from selectclock
6004	r/w	16 bit unsigned	0	1	0		Daylight Saving Time automatic
6011	r/w	16 bit unsigned	0	1439	0	min	Selectclock 1 - Time
6012	r/w	16 bit unsigned	0	10	0		Selectclock 1 - Day ▪ 0: Never; ▪ 1: Every day; ▪ 2: Weekday mon..fri; ▪ 3: Weekend sat+sun; ▪ 4: Monday; ▪ 5: Tuesday; ▪ 6: Wednesday; ▪ 7: Thursday; ▪ 8: Friday; ▪ 9: Saturday; ▪ 10: Sunday.
6013	r/w	16 bit unsigned	0	5	0		Selectclock 1 – Ventspeed ▪ 0: Ventspeed 0; ▪ 1: Ventspeed 1; ▪ 2: Ventspeed 2; ▪ 3: Ventspeed 3; ▪ 4: Ventspeed 4; ▪ 5: 2nd Setpoint Select.
6021	r/w	16 bit unsigned	0	1439	0	min	Selectclock 2 - Time
6022	r/w	16 bit unsigned	0	10	0		Selectclock 2 - Day
6023	r/w	16 bit unsigned	0	5	0		Selectclock 2 - Ventspeed
6031	r/w	16 bit unsigned	0	1439	0	min	Selectclock 3 - Time
6032	r/w	16 bit unsigned	0	10	0		Selectclock 3 - Day
6033	r/w	16 bit unsigned	0	5	0		Selectclock 3 - Ventspeed
6041	r/w	16 bit unsigned	0	1439	0	min	Selectclock 4 - Time
6042	r/w	16 bit unsigned	0	10	0		Selectclock 4 - Day
6043	r/w	16 bit unsigned	0	5	0		Selectclock 4 - Ventspeed
6051	r/w	16 bit unsigned	0	1439	0	min	Selectclock 5 - Time
6052	r/w	16 bit unsigned	0	10	0		Selectclock 5 - Day
6053	r/w	16 bit unsigned	0	5	0		Selectclock 5 - Ventspeed
6061	r/w	16 bit unsigned	0	1439	0	min	Selectclock 6 - Time
6062	r/w	16 bit unsigned	0	10	0		Selectclock 6 - Day
6063	r/w	16 bit unsigned	0	5	0		Selectclock 6 - Ventspeed

M70 – Filters

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
7001	r/w	16 bit unsigned	0	200000	0	m^3/h	Supply m^3/h set 1
7002	r/w	16 bit unsigned	0	2000	0	Pa	Supply max Pa set 1
7003	r/w	16 bit unsigned	0	200000	0	m^3/h	Supply m^3/h set 2
7004	r/w	16 bit unsigned	0	2000	0	Pa	Supply max Pa set 2
7005	r/w	16 bit unsigned	0	200000	0	m^3/h	Exhaust m^3/h set 1
7006	r/w	16 bit unsigned	0	2000	0	Pa	Exhaust max Pa set 1
7007	r/w	16 bit unsigned	0	200000	0	m^3/h	Exhaust m^3/h set 2
7008	r/w	16 bit unsigned	0	2000	0	Pa	Exhaust max Pa set 2
7009	r/w	16 bit unsigned	0	100	0	%	Hysterese detection
7010	r	16 bit unsigned			0	Pa	Press supply filter
7011	r	16 bit unsigned			0	Pa	Press exhaust filter
7012	r/w	16 bit unsigned	0	999	0	sec	Press Measurement Time
7013	r/w	16 bit unsigned	200	600	0	sec	Max filter press
7014	r/w	16 bit unsigned	0	999	0	days	Filter Period

M80 – Modbus

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
8001	r/w	16 bit unsigned	1	247	0		Adress
8002	r/w	16 bit unsigned	0	3	0		Baudrate,parity ▪ 0: 19k2,E,1 (even parity, 1 stopbit); ▪ 1: 19k2,N,2 (none parity, 2 stopbits); ▪ 2: 9600,E,1 (even parity, 1 stopbit); ▪ 3: 9600,N,2 (none parity, 2 stopbits).
8003	r/w	16 bit unsigned	0	999	0		Watchdog communication, reset M30

M90 – SD Card

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
9001	r	16 bit unsigned	0	9	0		Status ▪ 0: No card; ▪ 1: Fail; ▪ 2..5: Init; ▪ 6: Ready; ▪ 7..9: Writing.
9002	r/w	16 bit unsigned	0	1	0		Save parameters on SD card
9003	r/w	16 bit unsigned	0	1	0		Restore parameters from SD card

M99 – Service

HOLDING REGISTER	R / RW	FORMAT	MIN	MAX	PRESENTATION	UNIT	DESCRIPTION
9901	r	16 bit unsigned			0.00		Version number software
9903	r	16 bit unsigned			0	hrs	Poweron time
9904	r	16 bit unsigned			0.00		Version number I/O board
9999	r/w	16 bit unsigned			0		RESET ALL SETTINGS TO FACTORY DEFAULT (set code ….)

Asia

(China)
Zehnder (China)
Indoor Climate Co., Ltd.
Tuqiao, Liyuan Zhen,
Tongzhou District
101149 Beijing
T +86 10 6156 6704 /
139 0133 3341
F +86 10 6957 5690
info@zehnder.com.cn
www.zehnder.com.cn

Europe

Belgie (Belgium)
Zehnder Group Belgium nv/sa
Stephenson Plaza,
Blarenberglaan 3C/001
2800 Mechelen
T +32 15 28 05 10
F +32 15 28 05 11
info@zehnder.be
www.zehnder.be

Deutschland (Germany)
Zehnder Group Deutschland GmbH
Almweg 34
77933 Lahr
T +49 7821 586 0
F +49 7821 586 223
info@zehnder-systems.de
www.zehnder-systems.de

France (France)
Zehnder Group Services SAS
7, rue Jean Mermoz,
Courcouronnes / Saint Guenault
91031 Evry Cedex
T +33 169 361 646
F +33 169 474 581
comfosystems.france@
zehndergroup.com
www.comfosystems.fr

Great Britain
Zehnder Comfosystems
A division of Zehnder Group UK Ltd
Unit 1, Brookside Avenue
Rustington West Sussex
BN16 3LF
T +44 1903 777 333
F +44 1903 782 398
comfosystems@zehnder.co.uk
www.zehnder.co.uk

Italia (Italy)
Zehnder Group Italia S.r.l.
Via XXV Luglio, 6
Campogalliano (MO) 41011
T +39 059 978 62 00
F +39 059 978 62 01
info@comfosystems.it
www.comfosystems.it

Nederland (The Netherlands)
Zehnder Group Nederland B.V.
Lingenstraat 2
8028 PM Zwolle
T 0900 555 19 37 (€0,10 per minuut)
F +31 38 42 25 694
ventilatie@zehnder.nl
www.zehnder.nl

Polska (Poland)
Zehnder Polska Sp. z o.o.
ul. Kurpiow 14a
52-214 Wrocław
T +48 71 367 64 24
F +48 71 367 64 25
wentylacja@zehnder.pl
www.zehnder.pl

(Russia)
Sevastopolsky Prospect 11G
(2nd Floor)
117152 Moscow
T +7 495 988 50 15
F +7 495 988 50 16
info@zehndergroup.ru
www.zehndergroup.ru

Sverige (Sweden)
Zehnder Group Nordic AB
Mallslingan 22 - Box 7209
187 13 Taby
T +46 8 630 93 00
F +46 8 630 93 50
info@zehnder.se
www.zehnder.se

Schweiz (Switzerland)
Zehnder Group Schweiz AG
Zugerstrasse 162
8820 Wadenswil
T +41 43 833 20 20
F +41 43 833 20 21
info@zehnder-systems.ch
www.zehnder-systems.ch

Espana (Spain)
Zehnder Group Iberica IC, S.A.
Argenters, 7,
Parque Tecnologico del Valles
08290 Cerdanyola (Barcelona)
T +34 90 210 61 40
F +34 93 582 45 99
info@zehnder.es
www.zehnder.es

North America

United States
Zehnder America Inc.
540 Portsmouth Avenue
Greenland, NH 03840
T +1 603 422 6700
F +1 603 422 9611
info@zehnderamerica.com
www.zehnderamerica.com

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